

OBSTRUCTIVE JAUNDICE

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Jaundice (icterus)

Yellowing of skin, sclerae and mucous membranes caused by excess circulating bilirubin.

Definition

Jaundice or icterus,
yellowish discoloration

- *skin, mucous membranes, sclera.*
- *excess plasma bilirubin*
- *Normal range 5-17 mmol/l*
- *Clinically obvious 50 mmol/l*



Normal Physiology

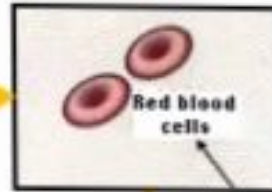
- Bilirubin is from breakdown of hemoglobin
- Unconjugated bilirubin transported to liver
 - Bound to albumin because **insoluble** in water
- Transported into hepatocyte & conjugated
 - With glucuronic acid → now water soluble
- Secreted into bile
- In ileum & colon, converted to urobilinogen
 - 10-20% reabsorbed into portal circulation and re-excreted into bile or into urine by kidneys

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Normal physiology

Liver, Spleen &
Bone marrow



Phagocytosis & Lysis

Hemoglobin

Globin

Heme

Bilirubin

Amino acids

Fe²⁺

Through Liver

Amino acid pool

Excreted

Bilirubin Production & Metabolism:

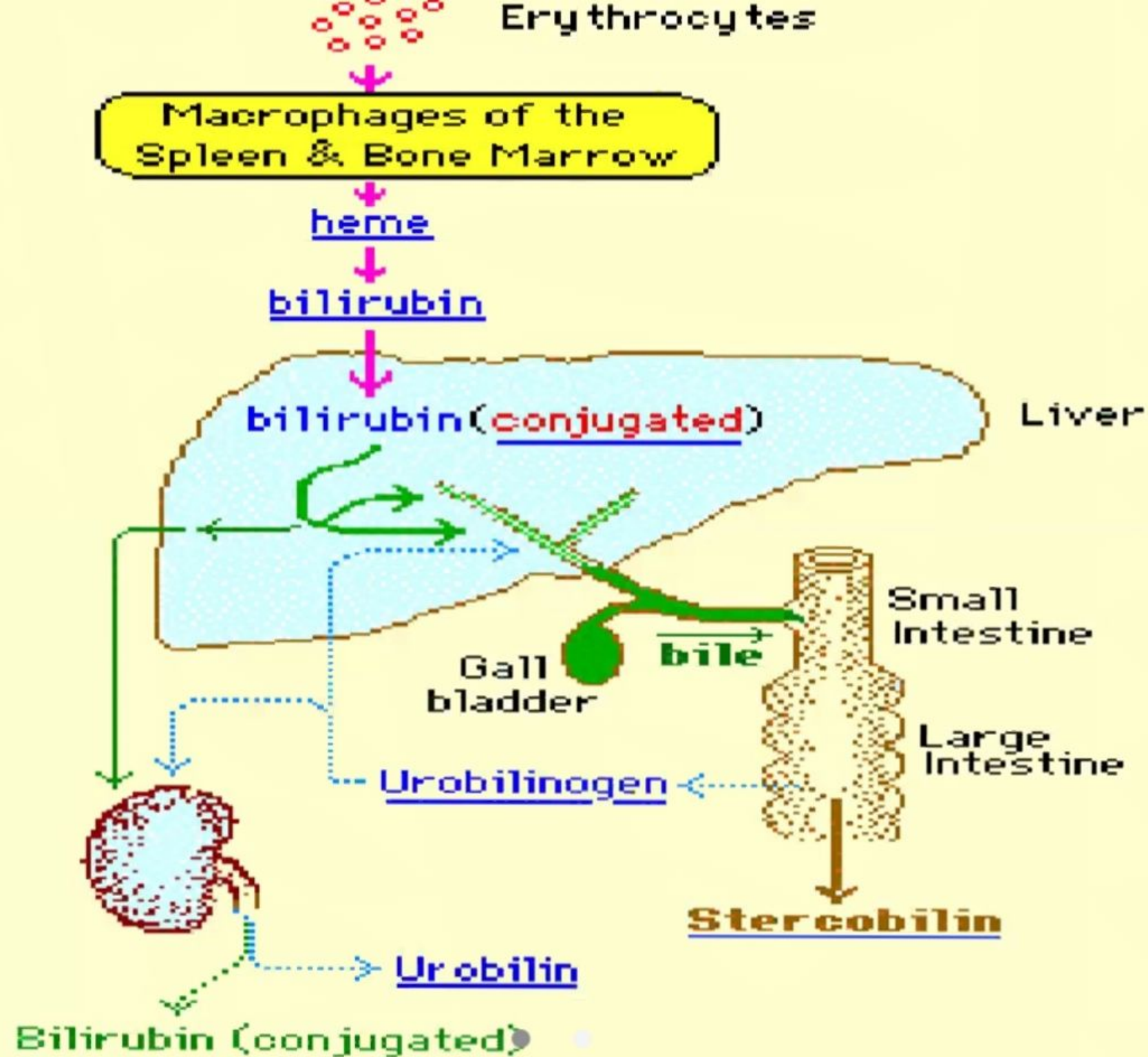
About 70 to 80% of the 250 to 300 mg of bilirubin produced each day is derived from the breakdown of hemoglobin in senescent red blood cells

The remainder comes from prematurely destroyed erythroid cells in bone marrow and from the turnover of hemoproteins such as myoglobin and cytochromes found in tissues throughout the body.

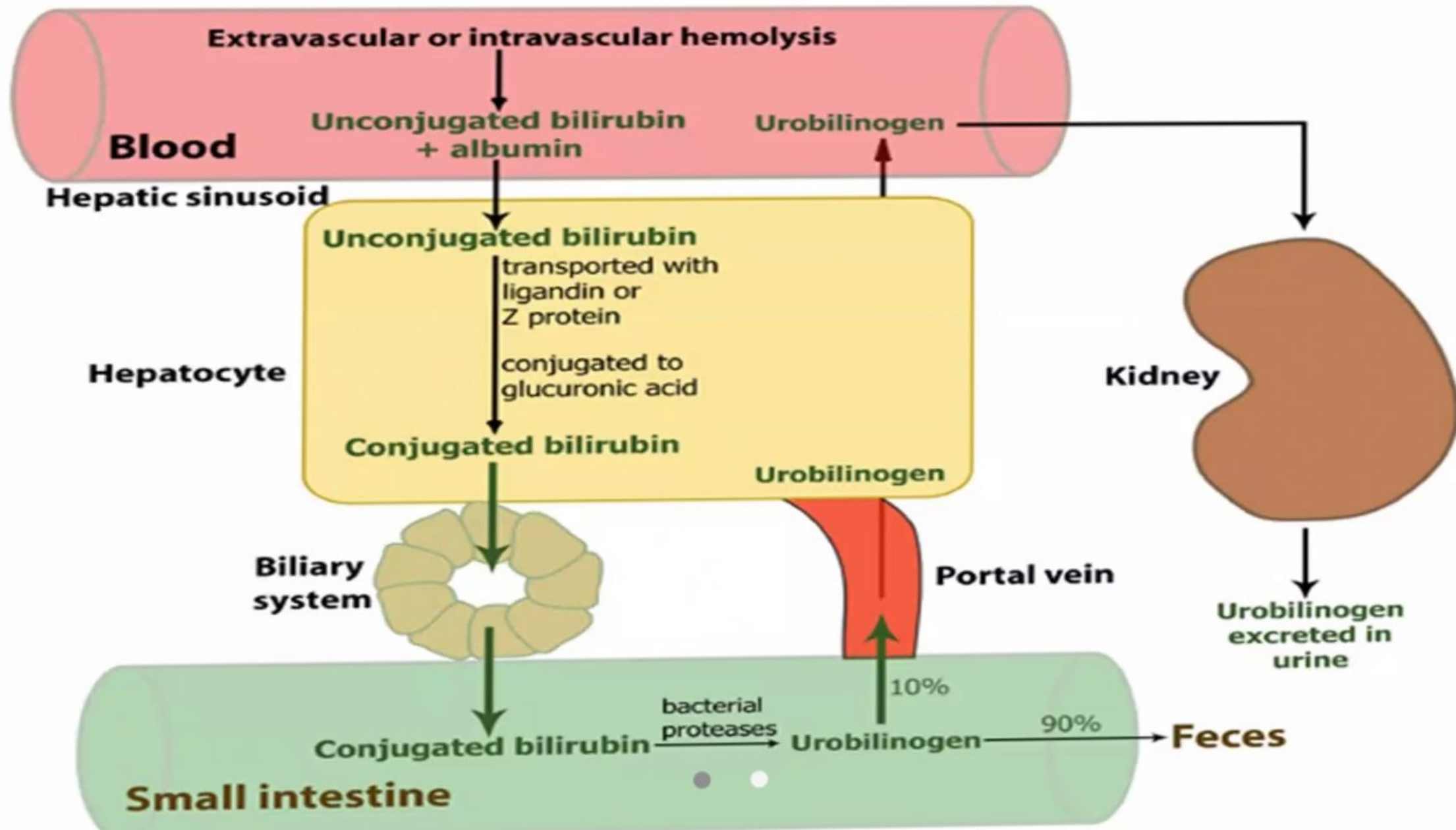
Formation of Bilirubin Mainly in RES (Spleen)

Conjugation of bilirubin in Hepatocyte

Exc^r



Bilirubin Production & Metabolism:



Bile components

- Water
- Bilirubin
- Cholesterol
- Bile salts (chenodeoxycholic/ cholic acid salts)
- Electrolytes

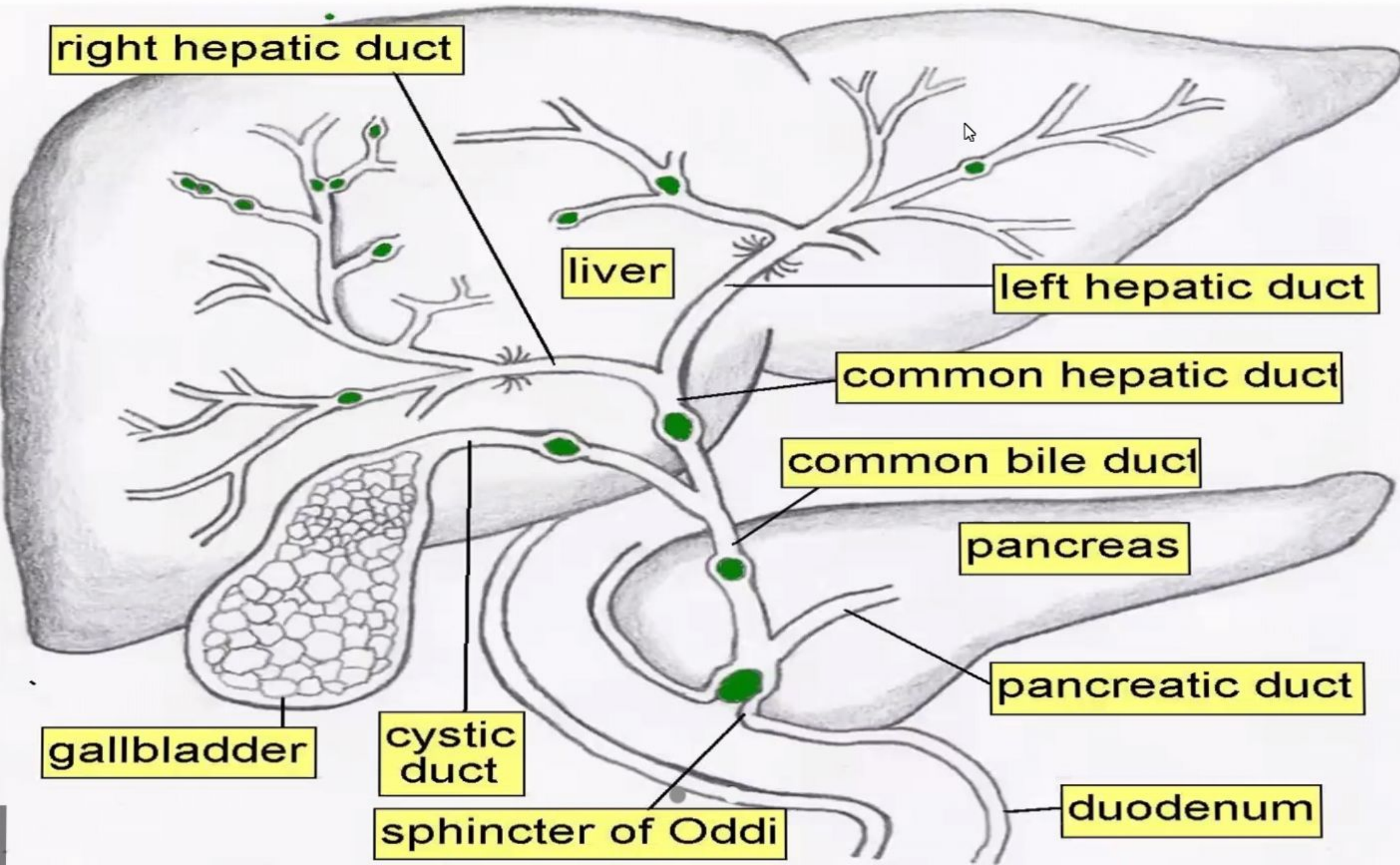
Functions of Bile Salts

- Important for cholesterol excretion:
 1. As metabolic products of cholesterol
 2. increases cholesterol solubility in bile
- Emulsifying factors for dietary lipids, a prerequisite step for efficient lipid digestion
- Cofactor for pancreatic lipase
- Facilitate intestinal lipid absorption by formation of mixed micelle

Obstructive jaundice

- Jaundice due to blockage of bile flow either intra-hepatic or extrahepatic

Anatomy of biliary system



Causes of obstructive jaundice

- Choledocholithiasis- CBD or CHD stone
- Cancer of the head of pancreas
- Cholangiocarcinoma
- Peri-ampullary tumours
- CBD strictures
- Tumours at the porta hepatis- lymphoma, hepatoma, mets

Causes of obstructive jaundice

- Primary sclerosing cholangitis
- Pancreatitis- acute or chronic
- Mirizzi syndrome
- CBD injuries
- Ascending cholangitis
- Parasites- *Ascaris lumbricoides*, *Clonorchis sinensis*, *Fasciola hepatica*

Initial Evaluation: History

- Jaundice: progressive or intermittent
- Acholic stools, tea-colored urine
- Pruritus
- Abdominal pain
- H/O cholelithiasis
- Fever/chills, RUQ pain (cholangitis)
 - Could lead to life-threatening septic shock
- Reasons to have hepatitis or cirrhosis?
 - Alcohol, Viral, risk factors for viral hepatitis
- Exposure to toxins or offending drugs

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Cont:

- Inherited disorders or hemolytic conditions
- Recent blood transfusions or blood loss?
- Is patient septic or on TPN?
- Recent gallbladder surgery? (CBD injury)
- Weight loss

Initial Evaluation: Physical Exam

- Signs of end stage liver disease (cirrhosis)
 - **Ascites**, splenomegaly, spider naevi, and gynecomastia
- Jaundice evident first underneath the tongue, also evident in sclerae or skin
- Courvoisier's sign = painless, but palpable or distended gallbladder on exam (? **malignant** obstruction)
- Lymphadenopathy- Virchow/ Sr Mary Joseph

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Obstructive Jaundice

Clinical features

Dark urine/pale stools

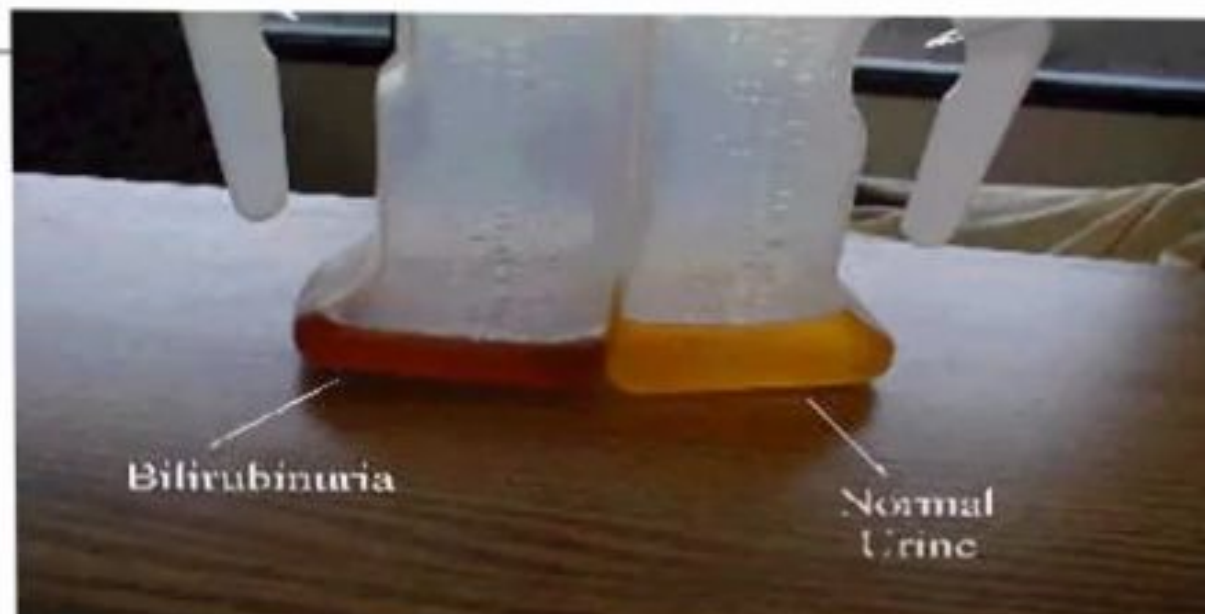
Deep Jaundice

Yellow sclerae

?Progressive/intermittent

?Pain

? Scratch marks



Investigations : lab

LFT

- Raised bilirubin- direct > indirect
- Raised Alkaline phosphatase
- Transaminases- elevated or normal
- GGT- elevated or normal
- Albumin- usually normal

Investigations: labs

- Viral markers
- UEC
- Coagulation screen: PTI/INR
- TBC
- Tumor markers : CA 19-9, CEA & CA-125

Investigations: imaging

- Ultrasound
- ERCP $\pm$ endoscopic ultrasound
- MRCP
- CT scan abdomen
- Percutaneous Transhepatic Cholangiogram (PTC)

Ultrasound

- Standard initial imaging of pt with jaundice
- Non-invasive
- Cheap
- Does not expose patient to radiation

Ultrasound

- Calculi
- Size of gall bladder
- Thickness of gall bladder wall
- Gall bladder polyps
- Presence of inflammation/ fluid around GB
- Dilation of intra & extrahepatic biliary tree
- CBD diameter
- Pancreatic head tumours

ERCP

- Biliary tree visualized
- Requires special training & equipment
- Bile can be taken for cytology/ microbio
- Mucosal brushings for cytology
- Therapeutic- removal of stone/ stenting/ sphincterotomy

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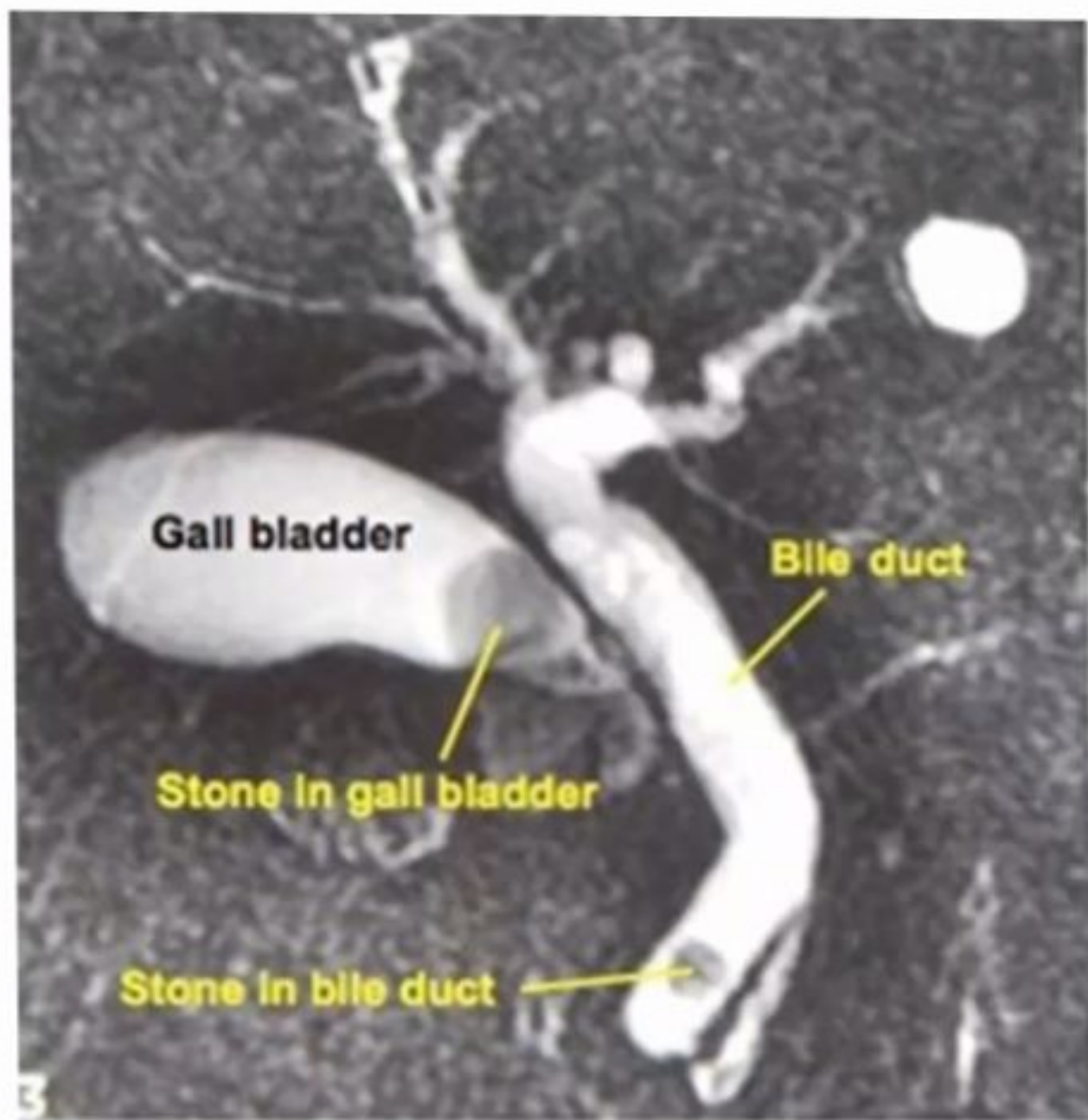
Endoscopic Retrograde Cholangio-Pancreatography

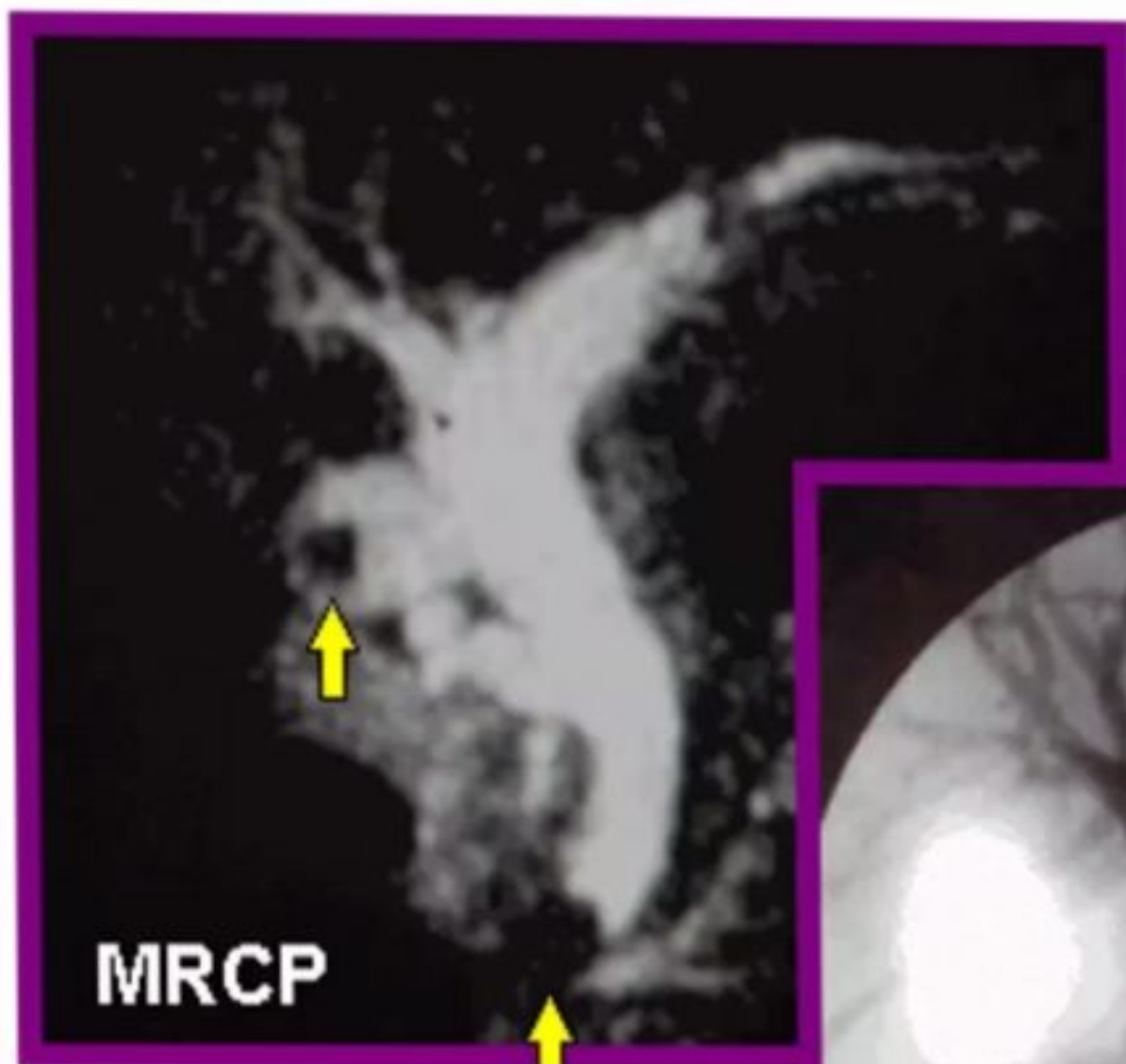
Therapeutic
Sphincterotomy



MRCP

- Expensive
- Detailed anatomy





Gallstone



CT scan abdomen

- Expensive
- Not readily available countrywide
- Radiation exposure

SHOWS:

- Gall bladder tumours
- Extrahepatic bile duct tumours
- Pancreatic tumours
- Lymphadenopathy

Obstructive Jaundice

CT

More likely to identify site and nature of obstruction

More costly, more radiation



PTC

- Requires fluoroscopy
- Requires specialized training
- Can be therapeutic

percutaneous transhepatic catheter

distended common
bile duct due to
calculi obstruction



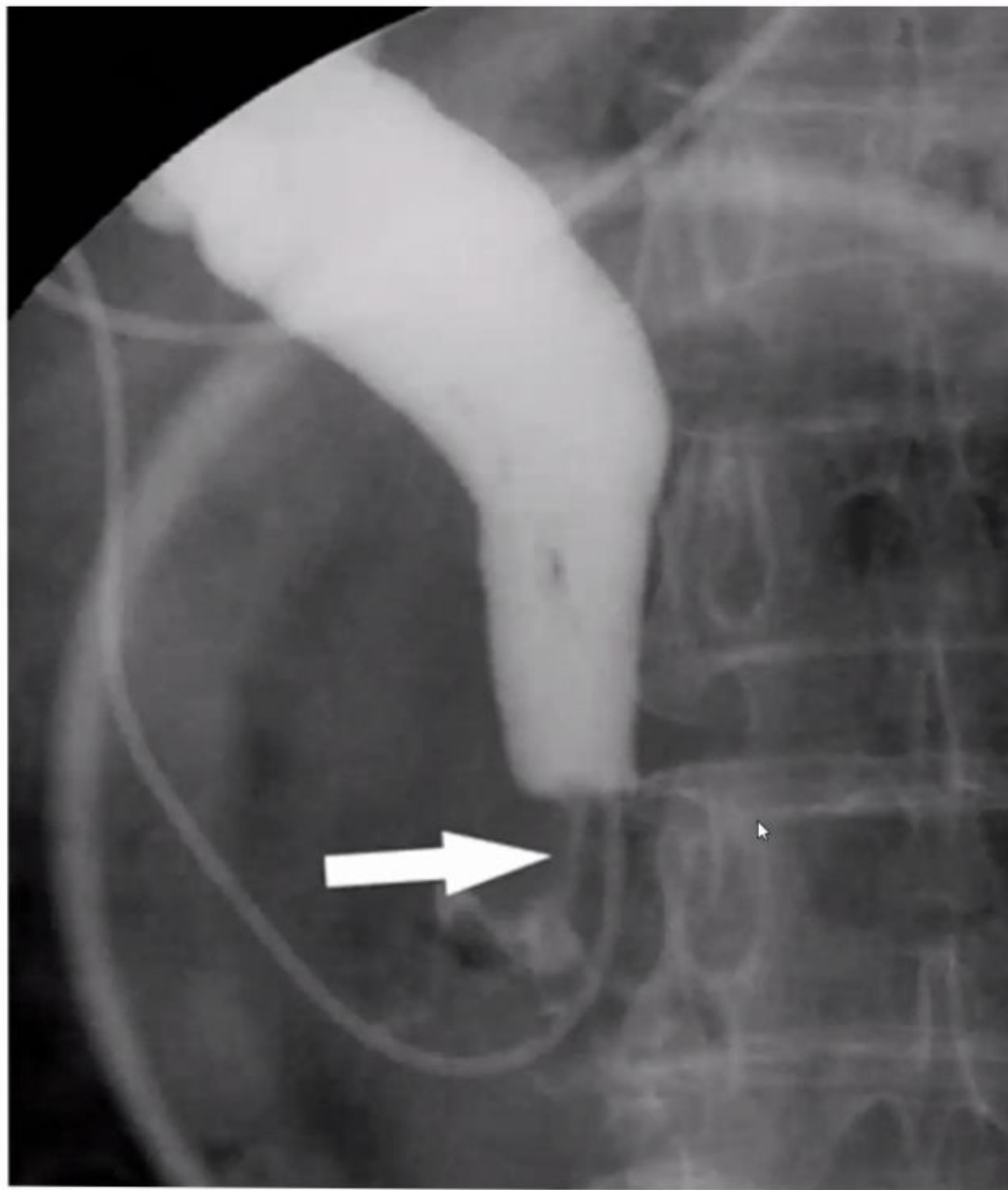
PTC

- Used for external drainage
- Placement of stents
- Can facilitate choledocoscopy



Management principles

- Aim to relieve the obstruction
- Optimize the patient pre-op
- Correct coagulopathy



Perioperative management of patient with obstructive jaundice

- Correct coagulopathy: injection vitamin K/ FFP
- REHYDRATE- to prevent hepatorenal syndrome
- Antibiotics- to prevent sepsis
- Correct anaemia

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Management

- Choledocholithiasis- ERCP followed by laparoscopic cholecystectomy
OR open cholecystectomy with CBD exploration
- Pancreatic tumour: Whipple procedure or TRIPLE by-pass or Endoscopic/ percutaneous stenting

Management

- CBD stricture: Choledochoduodenostomy/
choledochojejunostomy/ Roux-en-Y
hepaticojejunostomy/ Stenting

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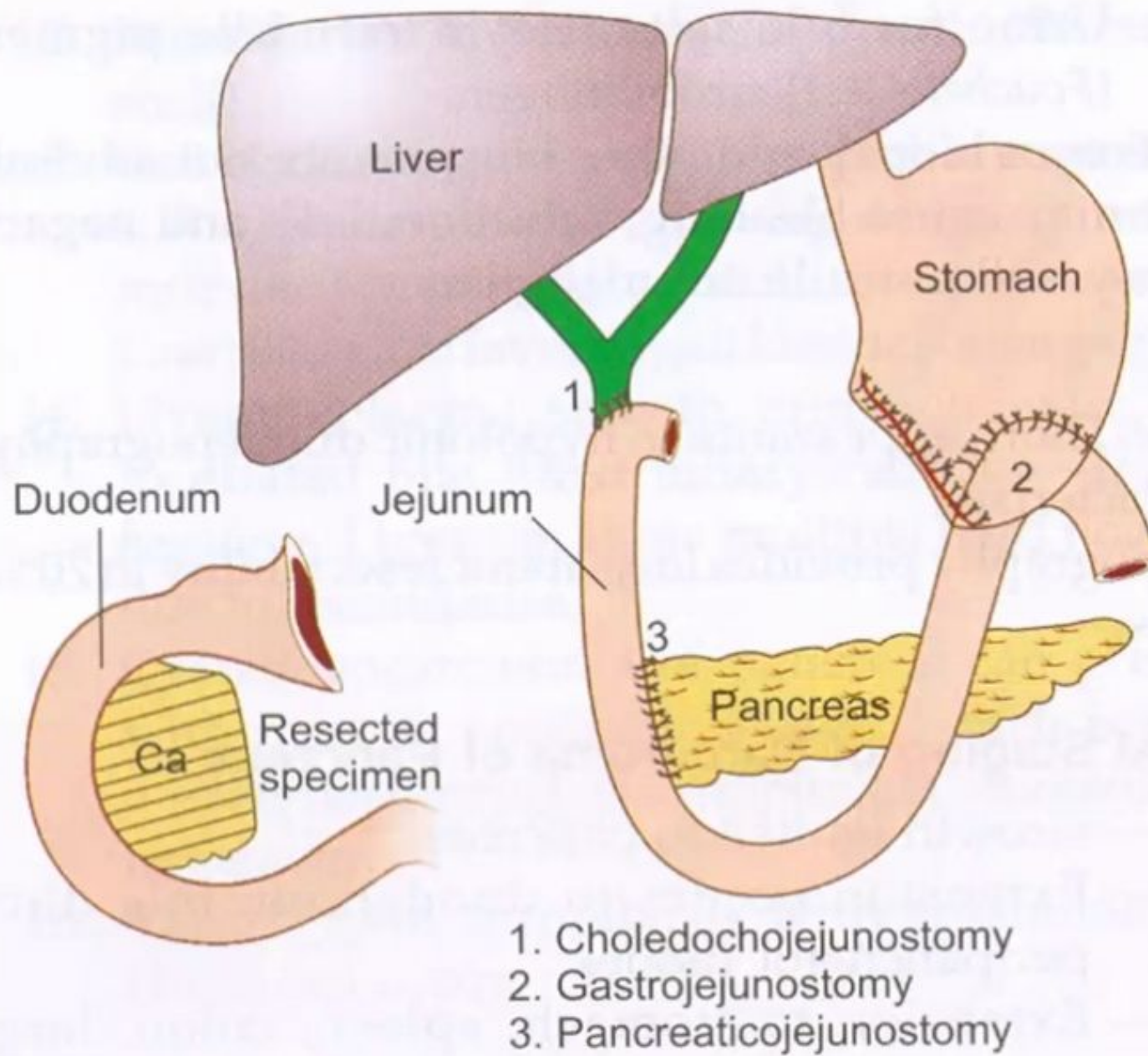


Fig. 14.24: Whipples operation.

THANK YOU

